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Connect NAS 8-11555

Fifth Quarterly Progress Report

November 1964 - January 1965

INABILITY FORM 602

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MARXIE COMPANY

INTRODUCTION

This is the fifth quarterly progress report to be submitted as required by Contract NAS 8-11555.

Progress against the program plan is summarized below:

<u>Milestone</u>	<u>Schedule Date</u>	<u>Actual Date</u>
1. Receipt of Ten Extrusions	12-31-63	1-3-64
2. Receipt of First Machined Extrusion	1-31-64	2-15-64
3. Complete Forming of First Unit	3-6-64	3-6-64
4. Complete Heat Treat of First Unit	3-20-64	4-9-64
5. Complete Shot Peening of First Unit	4-3-64	4-24-64
6. Receipt of Tenth Machined Extrusion	4-10-64	4-8-64
7. Complete Anodizing First Unit	4-17-64	5-15-64
8. Start Tests of First Unit	5-8-64	6-1-64
9. Complete Forming Tenth Unit	5-15-64	6-5-64
10. Complete Heat Treat Tenth Unit	5-29-64	6-19-64
11. Complete Tests of First Unit	6-5-64	7-1-64
12. Complete Shot Peening Tenth Unit	6-12-64	7-24-64
13. Complete ION Cleaning First Unit	6-19-64	7-20-64
14. Complete Anodizing Tenth Unit	6-26-64	9-3-64
15. Receipt of Five Extrusions	7-15-64	7-3-64
16. Start Tests of Tenth Unit	7-17-64	9-14-64
17. Five Units on Dock Boeing	8-4-64	7-28-64
18. Complete Tests Tenth Unit	8-14-64	9-30-64
19. Complete Forming Fifteenth Unit	10-9-64	10-30-64
20. Complete Heat Treat Fifteenth Unit	10-23-64	11-30-64
21. Complete Shot Peening Fifteenth Unit	11-13-64	12-15-64
22. Conduct Hardness Surveys	-	12-23-64
23. Leak Test, ION Clean Five Units	-	1-31-65
24. Boilout Treat, Shot Peen, etc., Six Units	-	
25. Ship Four Units to NSFC	2-3-65*	1-26-65
26. Ship Four Units to NSFC	3-1-65*	
27. Ship Four Units to NSFC	6-21-65*	
28. Ship Four Units to NSFC	7-9-65*	

*On Dock Date

Discussion of Work Performed During the Quarter

Investigation of the volumetric expansion problem continued during this quarter. The following briefly summarizes the actions taken and results obtained:

1. Furnace survey revealed a localized cold spot which was repaired.
2. Units 1-7 were returned to Martin by NASA for hardness measurements.
3. Unit 10 from NBS 8-5151 was returned to Martin by NASA for hardness measurements.
4. A trip was made to Denver to get hardness data from pieces of the four units burst during EUTP.

5. A hardness acceptance criteria was negotiated with NASA.
6. Six units, S/N 0014, 0016, 0019, 0021, 0023, 0024, were annullated for reheat treatment and subsequent processing through testing and cleaning.
7. Five units, S/N 0011, 0015, 0016, 0017, 0020 were scheduled for leak testing, cleaning and return to NASA.

Heat treating operations were resumed in November and units 11-15 were completed. After completing unit 11, the Vendor requested permission to charge the units into a hot furnace. Permission was granted and the last four units were heat treated in this manner. Subsequent to the heat treatment, the test bars of three of these units (S/N 0023, 0025, 0026) failed to meet the minimum elongation requirement. An investigation was initiated and is discussed below.

At the close of the quarter, two of the six units had been reheat treated. These units met the new hardness acceptance criteria. Distortion of the bosses was small and no difficulties are anticipated with the leak test.

An operator error was made in machining the -24 boss in unit S/N 0027. Eight threads per inch were cut rather than twelve. NASA agreed to accept this unit provided that the Martin Company supplied two MF 1815 with special threads to match this unit. These fittings were procured and the unit will be tested with these fittings.

Discussion of Problems Encountered During the Quarter

When the test results from S/N 0023, 0025, 0026 revealed low elongations, an investigation was conducted which established the following:

1. Test bars showed metallurgical evidence of overheating.
2. Examination of material cut from both ends of each unit did not reveal any overheating.
3. A furnace survey did not reveal any hot spots.
4. Vendor's temperature measuring and recording system was verified by an independent agency.
5. Both cold and hot start calibration runs were made using a fully instrumented bottle available from another contract.

The data obtained will be presented in report form in February. The Martin Company believes that this report will support the conclusion that the test bars were overheat but the bottles were not.

Work Planned for the Next Quarter

1. Delivery of four units.
2. Continuation of processing of last eight units.